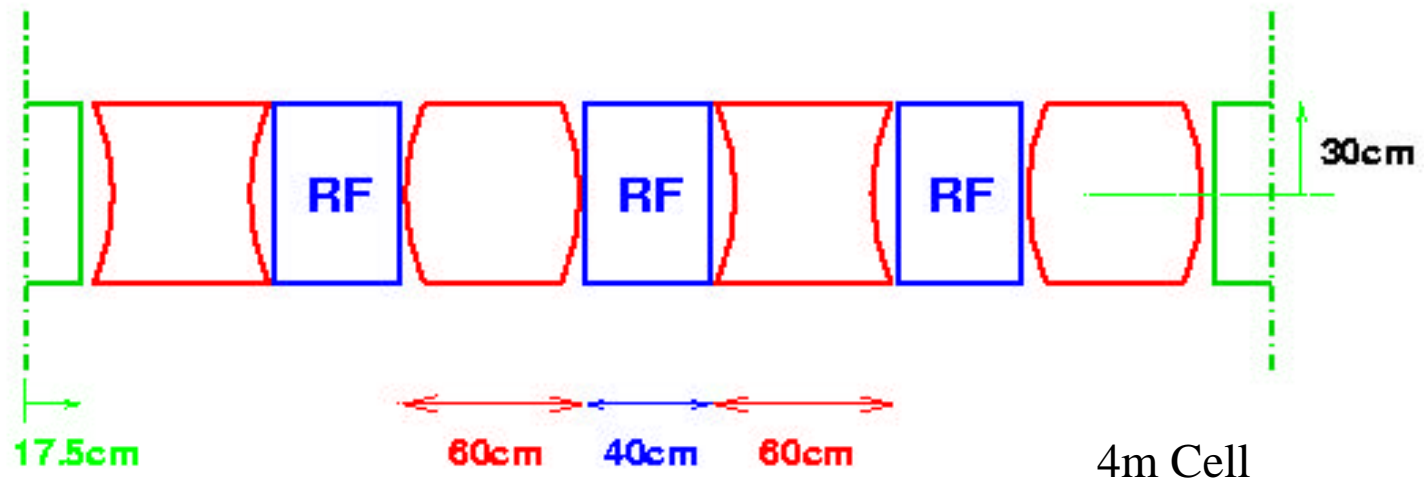


Quad Cooling Channel Simulation

by COSY Infinity



- Muons (180MeV/c to 245MeV/c)
- **Magnetic Quadrupoles ($k=2.88$)**
- **Liquid H Absorber: $-dE/dx = -12\text{MeV}/35\text{cm}$**
- Cavities: Energy gain $+12\text{MeV}/\text{Cell}$ to compensate the loss in the absorber

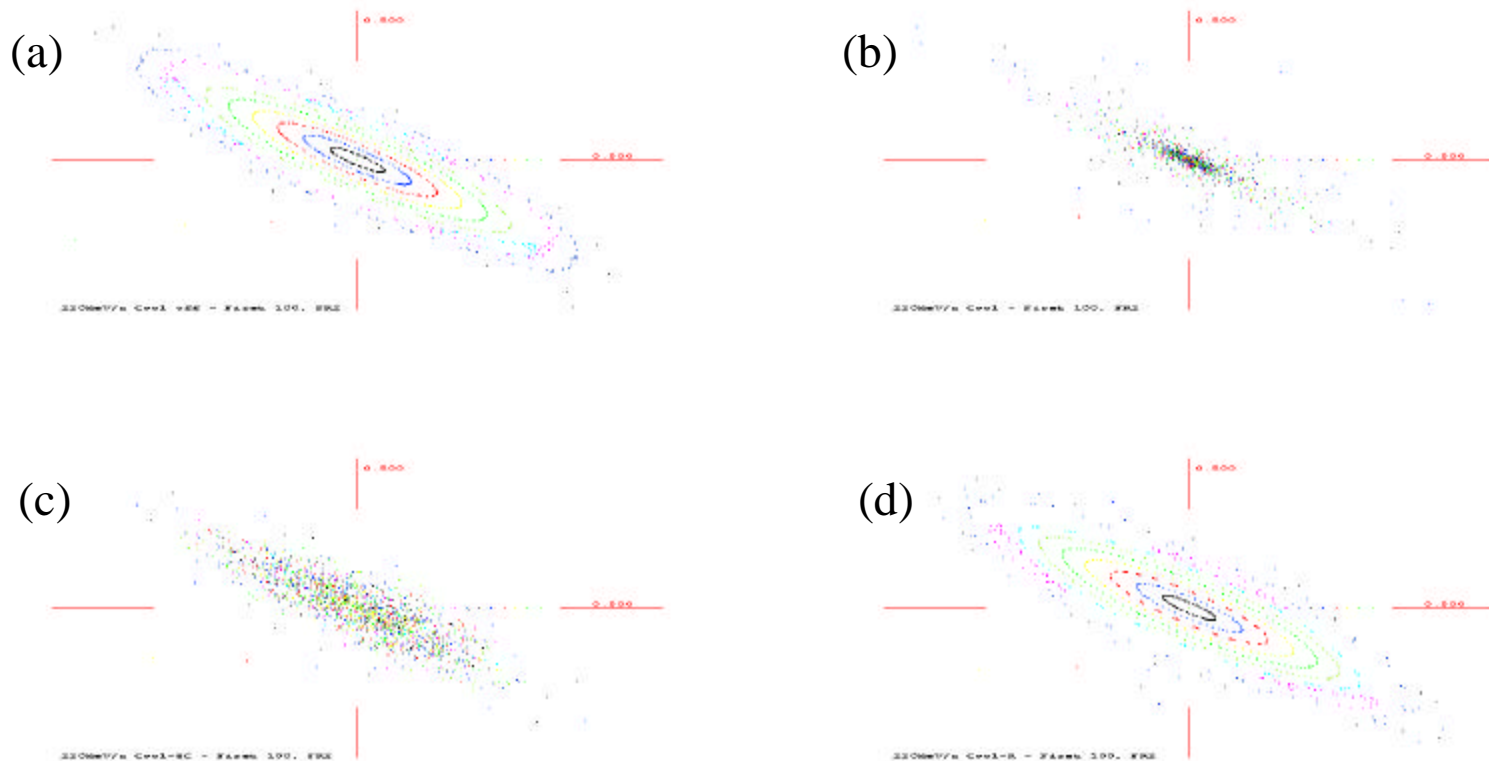
Tracking the Quad Cooling Cells

Momentum: 220 MeV/c, Starting from $x=2\text{cm}, 4\text{cm}, \dots, 30\text{cm}$, for 100 Cells

(a) Without Cooling (b) With Cooling (no scattering)

(c) With Cooling and Scattering

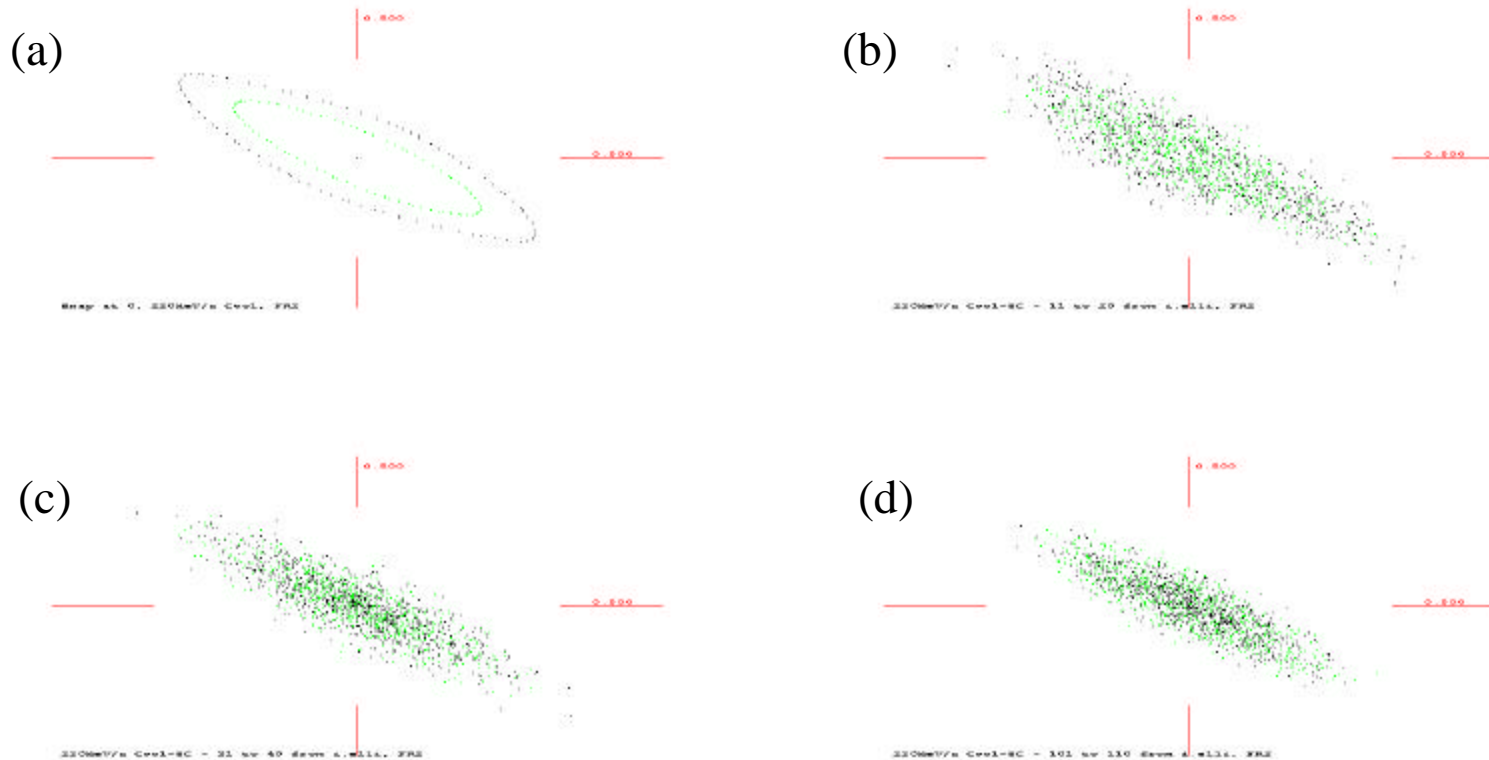
(d) Pseudo-Invariant Ellipses with Cooling (damping factor corrected)



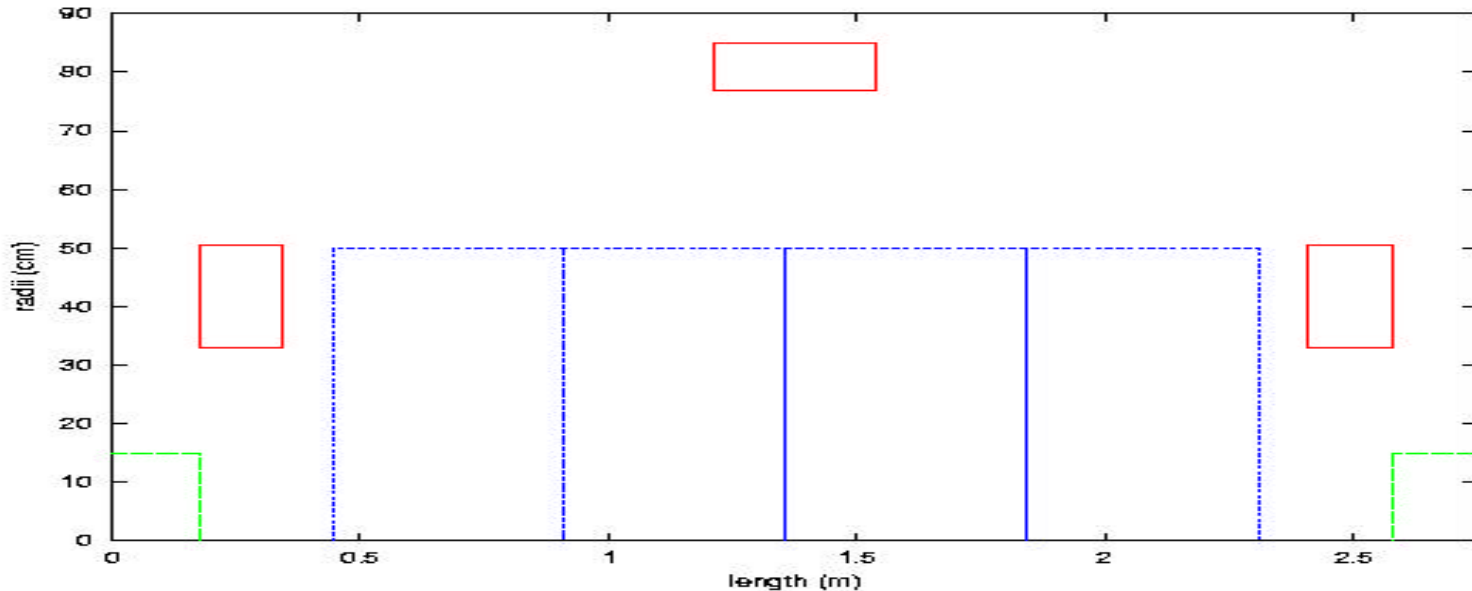
Tracking the Quad Cooling Cells with Scattering

Momentum: 220 MeV/c, Starting from x=10cm, 15cm Pseudo-Invariant Ellipses

(a) Initial Ellipses (b) for 11-20 Cells (c) for 31-40 Cells (d) for 101-110 Cells



sFOFO Cooling Channel Simulation by COSY Infinity



- Muons (180MeV/c to 245MeV/c)
- sFOFO Solenoids (Study II 2.75m Cell)
- Liquid H Absorber: $-dE/dx = -12\text{MeV}/35\text{cm}$
- Cavities: Energy gain $+12\text{MeV}/\text{Cell}$ to compensate the loss in the absorber

Tracking the sFOFO Cooling Cells

Momentum: 220 MeV/c, Starting from $x=1\text{cm}, 2\text{cm}, \dots, 15\text{cm}$, for 100 Cells

(a) Without Cooling

(b) Normal Form representation of it

(c) With Cooling and Scattering

(d) Normal Form representation of it

